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Howell et al.

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(54) **SUBSTANTIALLY CONSTANT-FORCE
EXERCISE MACHINE**

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(52) **U.S. Cl.** **482/121**

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See application file for complete search history.

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(57) **ABSTRACT**

A resistance module for an exercise machine for providing
a substantially constant force through a range of motion
includes at least one cantilever spring and at least one rigid
member movable with respect to one another along a path of
travel. The rigid member causes the cantilever spring to
deflect and produce a resistance force. The cantilever spring
has an anchored end and a deflection end. The rigid member
engages the deflection end of the cantilever spring, and
constrains the deflection end to a predetermined path of
deflection as the cantilever spring and the rigid member
move with respect to one another. The rigid member can be
a non-planer contact surface along which the deflection end
tracks, or a pivot link. The module can include means for
operatively coupling at least one of the cantilever spring and
the at least one rigid member to an exercise machine.

42 Claims, 8 Drawing Sheets

